

FILE 'REGISTRY'

L1 5 S (K AND AL AND B AND O)/ELS AND 4/ELC.SUB
L2 1 S 88160-55-8/RN

FILE 'HCAPLUS'

L3 317 S K2AL2B2O7 OR KAB OR KABO
L4 30541 S PATASSIUM(A)ALUMINUM(W)BORATE OR BORIC(W)AC
ID
L5 164330 S NONLINEAR? OR NON(W)LINEAR?
L6 1744244 S CRYSTAL?
L7 689693 S OPTICAL
L8 883714 S LED OR LIGHT(A)EMIT? OR LUMINANCE OR
LUMINESCENCE OR PHOTOLUMIN? OR ILLUMIN? OR ILLUME? OR
ILLUMINE?
OR LASER OR PLD OR OPTIC
L9 21 S L1 OR L2
L10 30840 S (L3 OR L4) NOT L9
L11 2813 S L10 AND L6
L12 205 S L11 AND L8
L13 43 S L5 AND L12
L14 40 S L3 AND L6
L15 22 S L14 NOT (L9 OR L13)
L16 30566 S POTASSIUM(A)ALUMINUM(W)BORATE OR BORIC(W)AC
ID
L17 2809 S L16 AND L6
L18 208 S L17 AND L8
L19 82 S L18 AND L7
L20 41 S L19 AND L5
L21 0 S L20 NOT (L9 OR L13 OR L14)
L22 725 S L4 AND L7
L23 227 S L22 AND L6
L24 77 S L23 AND L5
L25 41 S L24 NOT (L9 OR L13 OR L14)
L26 40 S L3 AND L6
L27 0 S L26 NOT (L9 OR L13 OR L14 OR L26)
L28 10 S K(N)AL(W)(BO OR BORATE OR B)

03/14/2003

L25 ANSWER 1 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:803568 HCAPLUS

DN 138:128307

TI Origin of near-ultraviolet absorption of **nonlinear BBO crystals**

AU Antsygin, Valery D.; Dashevsky, O. Yu.; Solntsev, V. P.; Mashkovtsev, R. I.; Tsvetkov, Eugene G.

CS Institute of Automation and Electrometry/Siberian Branch, Novosibirsk, 630090, Russia

SO Proceedings of SPIE-The International Society for Optical Engineering (2002), 4751(Nonlinear Optical Phenomena and Nonlinear Dynamics of Optical Systems), 247-251
CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

AB Defects in **nonlinear optical Ba metaborate crystals** were studied by **optical spectroscopy** and thermally activation methods. Low-temp. absorption peaks were obsd. at all samples. The dependence of these peaks upon **cryst.** phase and type of the flux used while growing is low. This fact indicates that intrinsic defects play the leading role in absorption origination. While growing BBO **crystals** by TSSG technique, defects, which form deep electron-type traps in the forbidden gap, are generated.

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 2 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:561980 HCAPLUS

DN 137:85717

TI **Nonlinear optical crystal** of large-size high-temp zinc borophosphate and its preparation and use

IN Wu, Yicheng; Wang, Guofu; Fu, Peizhen; Xu, Zuyan; Chen, Chuangtian

PA Low-Temp Technique Experiment Center, Chinese Academy of Sciences, Peop. Rep. China

SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 10 pp.
CODEN: CNXXEV

DT Patent

LA Chinese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | CN 1320725 | A | 20011107 | CN 2000-106163 | 20000427 |
| PRAI | CN 2000-106163 | | 20000427 | | |

AB **Nonlinear optical crystals** are described by the general formula $\beta\text{-Zn}_3\text{BPO}_7$, are transparent in the region 250-2500 nm, and have **nonlinear** coeff. $d_{22} = 0.69 \text{ pm/V}$, $n_o > n_e$, and Mohs hardness 5.0. Methods of prepg. the materials are described which entail mixing compds. contg. Zn, B and P (mole ratio of Zn:B:P = 3:1:1), milling, melting in a crucible for 1-24 h, cooling to 1-5.degree. above the m.p.; and growing the $\beta\text{-Zn}_3\text{BPO}_7$ **crystal** using **crystal** seeds, and annealing to 550-650.degree. at $\leq 120 \text{ degree/h}$. The Zn-contg. precursor may be selected from ZnO, zinc chloride, zinc carbonate, zinc nitrate, zinc oxalate, and zinc borate. The B-contg. precursor may be selected from **boric acid** and boron oxide. The P-contg. precursor may be selected from phosphorus oxide, ammonium dihydrogen phosphate, and ammonium hydrogen phosphate. Use of the **crystals** in frequency converters (esp. frequency doublers) and **optical** parametric oscillators is also described.

03/14/2003

L25 ANSWER 3 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:492798 HCAPLUS

DN 137:161028

TI Experimental preparation of Werner state via spontaneous parametric down-conversion

AU Zhang, Yong-Sheng; Huang, Yun-Feng; Li, Chuan-Feng; Guo, Guang-Can
CS Lab. Quantum Information, Univ. Sci. Technology China, Hefei, 230026, Peop. Rep. China

SO Los Alamos National Laboratory, Preprint Archive, Quantum Physics (2002) 1-12, arXiv:quant-ph/0206166, 24 Jun 2002

CODEN: LNQPFF4

URL: <http://xxx.lanl.gov/pdf/quant-ph/0206166>

PB Los Alamos National Laboratory

DT Preprint

LA English

AB The authors present an expt. of prepg. Werner state via spontaneous parametric down-conversion and controlled decoherence of photons. In this expt. two independent BBO (beta-Ba borate) **crystals** were used to produce down-conversion light beams, which are mixed to prep. Werner state.

RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 4 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:401184 HCAPLUS

DN 137:192325

TI Cracking mechanism in CLBO **crystals** at room temperature

AU Pan, Feng; Wang, Xiaoqing; Shen, Guangqiu; Shen, Dezhong
CS Department of Chemistry, Tsinghua University, Beijing, 100084, Peop. Rep. China

SO Journal of Crystal Growth (2002), 241(1-2), 129-134

CODEN: JCRGAE; ISSN: 0022-0248

PB Elsevier Science B.V.

DT Journal

LA English

AB CsLiB6O10 (CLBO) single **crystals** tend to crack at room temp. in an ambient air atm., which has limited their use in device applications. The cracking of high-quality CLBO **crystals** results from the anisotropic corrosive effect of H2O vapor in the ambient atm. The directional attack by H2O mols. at the **crystal** surface was related to its **crystal** structure. The **crystal** quality of CLBO influences the crack propagation velocity.

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 5 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:325062 HCAPLUS

DN 137:70719

TI Lithium borodilactate

AU Dhanuskodi, S.; Angeli Mary, P. A.; Thamotharan, S.; Parthasarathi, V.

CS Department of Physics, Bharathidasan University, Tiruchirappalli, 620 024, India

SO Acta Crystallographica, Section E: Structure Reports Online (2002), E58(5), m212-m214

CODEN: ACSEBH; ISSN: 1600-5368

URL: <http://journals.iucr.org/e/issues/2002/05/00/cf6157/cf6157.pdf>

PB International Union of Crystallography

DT Journal; (online computer file)

LA English

AB **Crystals** of the title compd. are monoclinic, space group P21, with a 6.7089(16), b 12.0650(15), c 11.0782(16) .ANG., .beta.

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97.472(17).degree.; Z = 2 (2 mols./Z), dc = 1.448, dm = 1.40; R = 0.028, Rw(F2) = 0.079 for 1655 reflections. The asym. unit consists of two Li borodilactate moieties. Li+ cations are tetracoordinated by O atoms of the borodilactate anions. The Li-O distances range from 1.907(5) to 2.050(5) .ANG.. The trivalent B is tetrahedrally coordinated by four O atoms of the borodilactate moieties. B makes two short and two long covalent bonds with O atoms, and the distances range from 1.430(3) to 1.507(3) .ANG.. This compd. exhibits **nonlinear optical** properties, combined with good chem. stability.

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 6 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:92077 HCAPLUS

DN 136:288072

TI A Chiral Lead Borate Containing Infinite and Finite Chains Built up from BO4 and BO3 Units

AU Yu, Zhen-Tao; Shi, Zhan; Jiang, Yu-Sheng; Yuan, Hong-Ming; Chen, Jie-Sheng
CS State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, Department of Chemistry, Jilin University, Changchun, 130023, Peop. Rep. China

SO Chemistry of Materials (2002), 14(3), 1314-1318
CODEN: CMATEX; ISSN: 0897-4756

PB American Chemical Society

DT Journal

LA English

AB With a hydrothermal technique, a novel chiral lead borate (Pb6B11O18(OH)9) was prepd. The sample was characterized by powder x-ray diffraction, IR spectroscopy, energy-dispersive spectroscopy, thermal anal., and 2nd-harmonic generation powder measurement. The structure of the compd., which **crystallizes** in the trigonal space group P32 with a 11.7691(7) and c 13.3361(12) .ANG. was solved by single-**crystal** x-ray diffraction anal. There exist infinite helical chains and finite chain fragments built up from BO4 and BO3 units. In the compd. the Pb2+ cations are located in the space between adjacent polyborate anionic chains, compensating the neg. charges of the chains. The chiral feature of the lead borate is unique, and because it lacks symmetry center, the compd. exhibits distinct NLO properties.

RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 7 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2002:78771 HCAPLUS

DN 136:288048

TI New **nonlinear-optical** Pb3(OH)[B9O16][B(OH)3] **crystal** with the zeolite-like nonaborate framework, its place in systematization, and structure-genetic relation to PbB4O7

AU Belokoneva, E. L.; Stefanovich, S. Yu; Borisova, T. A.; Dimitrova, O. V.

CS Mosk. Gos. Univ. im. M. V. Lomonosova, Moscow, Russia

SO Zhurnal Neorganicheskoi Khimii (2001), 46(11), 1788-1794

CODEN: ZNOKAQ; ISSN: 0044-457X

PB MAIK Nauka/Interperiodica Publishing

DT Journal

LA Russian

AB The conditions for the hydrothermal prepn. were studied and **crystal** structure of Pb3(OH)[B9O16][B(OH)3] (I) were detd. **Crystal** data: trigonal, space group P3lc, a 10.07(2), c 8,530(7) .ANG., R = 0.0441, Rw = 0.0462. The building units of a new type of cage [B9O16]5- are polar nonaborate groups, consisting of 6 tetrahedra ([B6O16]14-) and 3 triangular cages, suggesting a crown. The **crystals** of I have a higher **optical nonlinearity**

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than that for PbB4O7. When I was heated to .apprx.600.degree., it was converted to PbB4O7.

L25 ANSWER 8 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:893061 HCAPLUS

DN 136:128036

TI A new sodium samarium borate $\text{Na}_3\text{Sm}_2(\text{BO}_3)_3$

AU Zhang, Guochun; Wu, Yicheng; Fu, Peizhen; Wang, Guofu; Liu, Hongjun; Fan, Guo; Chen, Chuangtian

CS Department of Chemistry, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China

SO Journal of Physics and Chemistry of Solids (2001), Volume Date 2002, 63(1), 145-149

CODEN: JPCSAW; ISSN: 0022-3697

PB Elsevier Science Ltd.

DT Journal

LA English

AB A new Na Sm borate $\text{Na}_3\text{Sm}_2(\text{BO}_3)_3$ (NSBO) was synthesized by high temp. solid state reaction. The yellowish transparent single **crystals** of $\text{Na}_3\text{Sm}_2(\text{BO}_3)_3$ were grown from the $\text{Na}_2\text{CO}_3\text{-H}_3\text{BO}_3$ flux system using the top-seeded soln. growth (TSSG) method. X-ray diffraction anal. demonstrated that the NSBO **crystals** belong to orthorhombic systems and lattice parameters are a 5.0585, b 11.0421, c 7.0316 .ANG.. The measurement of the IR spectrum indicated that the basic anionic groups are the BO_3^{3-} groups. Also, $\text{Na}_3\text{Sm}_2(\text{BO}_3)_3$ exhibits an **optical** 2nd harmonic generation effect which is close to that of KDP (KH_2PO_4).

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 9 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:890559 HCAPLUS

DN 136:109639

TI Synchrotron-radiation topographic study on defects in **nonlinear optical crystal** CBO

AU Xu, Zi-jie; Wu, Yi-cheng; Fu, Pei-zhen; Wang, Jun-xin; Jiang, Jian-hua; Tian, Yu-lian

CS Department of Chemistry, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China

SO Rengong Jingti Xuebao (2001), 30(4), 379-382

CODEN: RJXUEN; ISSN: 1000-985X

PB Rengong Jingti Xuebaoshe

DT Journal

LA Chinese

AB CsB_3O_5 (CBO) **crystals** were grown by Kyropoulos methods from Cs_2CO_3 and H_3BO_3 as initial materials. The growth defects in CBO **crystal** at (001), (010), and (100) directions were studied by synchrotron radiation x-ray topog. The main defects in CBO **crystals** were growth layers, and the main cause of the growth defects were the shaky thermal convection and oscillation of temp., which brought about the change of microcosmic growth rate with the time and the disarrangement of particles on the surface of **crystals**.

L25 ANSWER 10 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:854129 HCAPLUS

DN 136:93055

TI Anisotropy of two-photon absorption in BBO at 264 nm

AU Isaenko, Ludmila I.; Dragomir, Adrian; McInerney, John G.; Nikogosyan, David N.

CS Siberian Branch, Design and Technological Institute of Monocrystals, Russian Academy of Sciences, Novosibirsk, 630058, Russia

SO Optics Communications (2001), 198(4-6), 433-438

03/14/2003

CODEN: OPCOB8; ISSN: 0030-4018

PB Elsevier Science B.V.

DT Journal

LA English

AB Femtosecond pulses at $\lambda = 264$ nm were used to measure the two-photon absorption (TPA) coeff. in β -BaB₂O₄ (BBO) **crystal**. **Nonlinear** absorption in BBO depends significantly on **crystal** cut and/or beam polarization. For an ordinary beam propagating along the **optical** axis (\parallel) and perpendicular to it (\perp) the similar values of TPA coeff. were obtained, $(68 \pm 6) \times 10^{-11}$ and $(66 \pm 7) \times 10^{-11}$ cm/W. For an extraordinary beam (\perp) the TPA coeff. is significantly smaller, $(47 \pm 5) \times 10^{-11}$ cm/W.

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 11 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:825108 HCAPLUS

DN 136:76846

TI Second-order **nonlinear optical** properties of solution-derived c-axis oriented β -BaB₂O₄ thin films

AU Kobayashi, Takeshi; Ogawa, Ryo; Matsuda, Hirofumi; Miyazawa, Kun'ichi; Kuwabara, Makoto

CS Department of Materials Science, University of Tokyo, Tokyo, 113-8656, Japan

SO Key Engineering Materials (2002), 216(Electroceramics in Japan IV), 97-100
CODEN: KEMAEY; ISSN: 1013-9826

PB Trans Tech Publications Ltd.

DT Journal

LA English

AB Thin films of β -BBO with (001) orientation were successfully fabricated on SiO₂/Si and fused quartz substrates from solns. of Ba acetate and **boric acid**. The films were characterized by x-ray diffractometry, IR spectroscopy, and SEM. In the 1st stage of **crystn.**, nuclei that promote the (001) orientation are formed before the formation of (B306)3-. The nuclei of the (001) orientation are expected to be the Ba lattice. The obtained films with (001) preferred orientation showed a good surface morphol. with no cracks and pores, whose thickness were ≈ 250 nm.

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 12 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2001:760975 HCAPLUS

DN 136:76732

TI Spectral characterization of second harmonic $\chi^{(2)}$ cascading phenomena

AU Olivie, G.; Caumes, J.-P.; Cussat Blanc, S.; Freysz, E.; Bourgeade, A.

CS Cent. de Physique Mol. Optique et Hertzienne, UMR 5798, Univ. Bordeaux 1, Talence, 33405, Fr.

SO Optics Express [online computer file] (2001), 9(4), 172-177

CODEN: OPEXFF; ISSN: 1094-4087

URL: <http://www.opticsexpress.org./oearchive/pdf/34723.pdf>

PB Optical Society of America

DT Journal; (online computer file)

LA English

AB The 2nd harmonic generation in a thin β -Ba borate **crystal** is used to measure $\chi^{(2)}$ cascading phenomena in the spectral domain. The harmonic generation is induced by 2 pulses produced by spectrally filtering a femtosecond pulse and centered at the wavelength $\lambda - \Delta\lambda$ and $\lambda + \Delta\lambda$. New spectral components appear in spectral d. of both the fundamental and harmonic

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pulses. High order cascading phenomena are evidenced. In good agreement with theor. predictions, for large phase mismatch the evolution of the spectra demonstrates the competition between cascaded .chi.(2) and .chi.(3) phenomena.

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 13 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:733081 HCAPLUS
DN 136:12405
TI A new **nonlinear optical** material-Na₃Sm₂(BO₃)₃
AU Zhang, Guo-chun; Wu, Yi-cheng; Fu, Pei-zhen; Wang, Guo-fu; Guo, Fan; Chen, Chuang-tian
CS Dep. of Chem., Univ. of Sci. and Technol. of China, Hefei, 230026, Peop. Rep. China
SO Rengong Jingti Xuebao (2001), 30(3), 227-231
CODEN: RJXUEN; ISSN: 1000-985X
PB Rengong Jingti Xuebaoshe
DT Journal
LA Chinese
AB A new **nonlinear optical** material Na₃Sm₂(BO₃)₃ was synthesized by solid reaction method. The yellowish transparent single **crystals** of Na₃Sm₂(BO₃)₃ were grown by suspending Pt wire method. The typical **crystal** size was .apprx.3 mm x 2 mm x 0.5 mm. X-ray diffraction anal. showed that it belongs to orthorhombic systems and lattice parameters a 0.50585, b 1.10421, c 0.70316 nm. The measurement of the IR spectrum indicated that the basic anionic group is the BO₃³⁻ group. By the **optical** 2nd harmonic generation (SHG) measurements Na₃Sm₂(BO₃)₃ exhibits **nonlinear optical** effect which is close to that of KDP.

L25 ANSWER 14 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:600667 HCAPLUS
DN 135:144491
TI Orthorhombic monohydrated dicalcium hexaborate as **nonlinear optical crystal** and its growth process and application
IN Guo, Fan; Fu, Peizhen; Wang, Junxin; Yang, Zhiping; Wu, Yicheng
PA Chinese Science and Technology Univ., Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 7 pp.
CODEN: CNXXEV
DT Patent
LA Chinese
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|-----------------|----------|
| | ----- | --- | ----- | ----- | ----- |
| PI | CN 1279306 | A | 20010110 | CN 1999-110079 | 19990705 |
| | CN 1084400 | B | 20020508 | | |
| PRAI | CN 1999-110079 | | 19990705 | | |
| AB | A method for hydrothermal crystal growth of 2CaO.3B ₂ O ₃ .H ₂ O entails adding CaO and H ₃ BO ₃ in the molar ratio of 1:3-8 to a high-pressure reactor, charging water to 30-80 vol.% of the reactor, feeding seed crystal , sealing, holding at 250-300.degree. for > 2 d in a furnace, cooling, and washing. Use of the crystals and nonlinear optical crystals (e.g., for frequency doubling) is also described. | | | | |

L25 ANSWER 15 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:539280 HCAPLUS
DN 135:249068
TI Theoretical analysis of noncollinear phase-matched **optical** parametric generation in BBO **crystal**

03/14/2003

AU Pang, Dongqing; Zhang, Ruobing; Sun, Jinghua; Wang, Qingyue
CS Optoelectronic Information Science and Technology Lab, College of
Precision Instruments and Optoelectronics Engineering, Tianjin University,
Tianjin, 300072, Peop. Rep. China
SO Optics & Laser Technology (2001), 33(4), 32249-254
CODEN: OLTCAS; ISSN: 0030-3992
PB Elsevier Science Ltd.
DT Journal
LA English
AB The authors propose a theor. treatment of noncollinear phase-matched
femtosecond parametric interaction process pumped by ultrashort
optical pulses, and studied the pulse characteristics of OPG in
BBO **crystal**. The results show that the major factors, which
affect the **optical** parametric conversion coeff. and durations of
the pulses, are the group velocity mismatch and the phase mismatch among
the 3 ultra-short pulses. In addn., the material dispersion can cause the
durations of the pulses to increase when pump pulse is <20 fs, and its
influence becomes more obvious at low pump intensity.
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 16 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:335576 HCAPLUS
DN 135:113646
TI A new **nonlinear optical** borate **crystal**
Na₃La₂(BO₃)₃
AU Zhang, Guochun; Wu, Yicheng; Fu, Peizhen; Wang, Guofu; Pan, Shilie; Chen,
Chuangtian
CS Department of Chemistry, University of Science and Technology of China,
Hefei, 230026, Peop. Rep. China
SO Chemistry Letters (2001), (5), 456-457
CODEN: CMLTAG; ISSN: 0366-7022
PB Chemical Society of Japan
DT Journal
LA English
AB A new **nonlinear optical** (NLO) borate **crystal**
Na₃La₂(BO₃)₃ (sodium lanthanum borate, NLBO) has been discovered. The
bar-shaped **crystal** with sizes up to 8.times.3.times.2 mm³ was
grown by the Top-Seeded Soln. Growth (TSSG) method using Na₂CO₃-H₃BO₃-NaF
as fluxes. The measurement of the IR spectrum indicated that the basic
anionic group is the BO₃ group. Furthermore, NLBO **crystal**
exhibits an **optical** second harmonic generation effect about
twice as large as that of KDP(KH₂PO₄).
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 17 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:267522 HCAPLUS
DN 135:99467
TI Growth of a new **nonlinear optical** **crystal**
Ba₂Be₂B₂O₇ by TSSG method
AU Qi, Hua; Chen, Chuangtian
CS Fujian Institute of Research on the structure of Matter, Beijing Center
for Crystal Research and Development, The Chinese Academy of Sciences,
Fuzhou, 350002, Peop. Rep. China
SO Chemistry Letters (2001), (4), 352-353
CODEN: CMLTAG; ISSN: 0366-7022
PB Chemical Society of Japan
DT Journal
LA English
AB A new **nonlinear optical** Ba₂Be₂B₂O₇ **crystal**

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was grown by top-seeded soln. growth method using BaB2O4-BaCO3-NaF fluxes. The DTA curve and a typical angle-tuned curve of Ba2Be2B2O7 **crystal** were also studied. The measured UV absorption edge of the title **crystal** is .apprx.215 nm.

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 18 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:876973 HCAPLUS

DN 134:49015

TI UV radiation **optical** apparatus

IN Wada, Hiroyuki; Oka, Michio; Tazuki, Koichi

PA Sony Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------------|------|------|-----------------|------|
|--|------------|------|------|-----------------|------|

| | | | | | |
|----|---------------|----|----------|----------------|----------|
| PI | JP 2000347234 | A2 | 20001215 | JP 1999-161253 | 19990608 |
|----|---------------|----|----------|----------------|----------|

| | | | | | |
|------|----------------|--|----------|--|--|
| PRAI | JP 1999-161253 | | 19990608 | | |
|------|----------------|--|----------|--|--|

AB The app. comprises: (1) an air-tight encasement; (2) a pair of input and output windows passing through the UV radiation; (3) a pair of half mirrors and a pair of reflecting mirrors; (4) a **nonlinear optical crystal**; and (5) a gas inlet for a dry air contg. H2O < 5,000 ppm.

L25 ANSWER 19 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:701099 HCAPLUS

DN 134:172184

TI Hydrothermal synthesis, characterization and **nonlinear optical** effect of orthorhombic phase Ca2B6O11.cntdot.H2O

AU Guo, Fan; Fu, Peizhen; Wang, Junxin; Liu, Feng; Yang, Zhiping; Wu, Yicheng

CS Department of Earth and Space Sciences, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China

SO Chinese Science Bulletin (2000), 45(19), 1756-1760

CODEN: CSBUEF; ISSN: 1001-6538

PB Science in China Press

DT Journal

LA English

AB Hydrothermal treatment of CaO and **boric acid** mixts. at 234-300.degree. produced a colorless, transparent, orthorhombic compd. Ca2B6O11.cntdot.H2O. Of the seven known members of hydrated dicalcium hexaborate contg. B-O six-membered ring anionic group (B3O8), only the title compd. has the, **nonlinear optical** effect. The 2nd harmonic generation (SHG) effect of its **crystal** is larger than that of KH2PO4 (KDP). The reflection spectrum showed that this compd. has no absorption in the exptl. wavelength range (800-240 nm). Its **crystal** structure is favorable for generating the **nonlinear optical** effect.

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 20 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:658928 HCAPLUS

DN 133:353772

TI The influence of different remelting conditions on the transparency and **optical** properties of borate glass incorporated with .beta.-BaB2O4

AU Tsai, Y. E.; Chang, Y. H.; Lo, K. Y.

CS Department of Materials Science and Engineering, National Cheng Kung

03/14/2003

University, Tainan, Taiwan
SO Materials Science & Engineering, A: Structural Materials: Properties,
Microstructure and Processing (2000), A293(1-2), 229-234
CODEN: MSAPE3; ISSN: 0921-5093
PB Elsevier Science S.A.
DT Journal
LA English
AB The fabrication of transparent B2O3-based glasses contg. **nonlinear optical crystals** of .beta.-BaB2O4 particles by the incorporation method was studied. Some properties such as refractive index, n, second harmonic generation (SHG) efficiency and elec. resistance of the remelted glasses were measured. Tg and Tx were decreased by the addn. of BBO particles. A small difference in the refractive index between matrix glasses and incorporated **crystals** is a significant reason for the transparency. The best efficiency for SHG was 10% of the BBO **crystal** for the sample remelted by mixing the 40BaO-30B2O3-25SiO2-5K2O (GPII) glass and 15 wt.% BBO content at 960.degree.C for 3 min.
RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 21 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 2000:513982 HCAPLUS
DN 133:96583
TI **Nonlinear optical crystal** Ba2Be2B2O7
IN Chen, Chuangtian; Qi, Hua; Zeng, Wenhua; Wu, Baichang; Wang, Yebin
PA Fujian Matter-Structure Institute, Chinese Academy of Sciences, Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 12 pp.
CODEN: CNXXEV
DT Patent
LA Chinese
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|-----------------|----------|
| PI | CN 1225952 | A | 19990818 | CN 1998-104744 | 19980211 |
| | CN 1076054 | B | 20011212 | | |
| PRAI | CN 1998-104744 | | 19980211 | | |
| AB | Barium beryllium borate nonlinear optical crystals with unit cell parameters of the crystal are a = b = 8.2892 .ANG., c = 8.0482 .ANG., .alpha. = .beta. = 90.degree., .gamma. = 120.degree., cell vol. V = 479.4 .ANG. ³ , and Z = 3 are described. The crystals may be prepd. using a seed crystal from a melt of Ba2Be2B2O7 (prepd. from BaCO3, H3BO3, and BeO by high temp. solid phase reaction) 9-16, BaO 52-59, and B2O3 30-33 mol; dilg. agent of NaF is also used, and its addn. is about 20% of the raw material. The growing temp. is 1020-1060.degree., crystal rotary speed 10-20 rpm, and cooling speed 1-2.degree.d-1. The crystal can be used in harmonic generators, optical waveguide devices, etc. | | | | |

L25 ANSWER 22 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 2000:390755 HCAPLUS
DN 133:96442
TI Experimental demonstration of the relative phase operator
AU Trifonov, Alexei; Tsegaye, Tedros; Bjork, Gunnar; Soderholm, Jonas; Goobar, Edgard; Atature, Mete; Sergienko, Alexander V.
CS Department of Electronics, Royal Institute of Technology (KTH), Kista, SE-164 40, Swed.
SO Journal of Optics B: Quantum and Semiclassical Optics (2000), 2(2), 105-112

03/14/2003

CODEN: JOBOFD; ISSN: 1464-4266

PB Institute of Physics Publishing

DT Journal

LA English

AB The authors have exptl. demonstrated a realization of the 2-mode relative phase operator introduced by Luis and Sanchez-Soto. The relative phase distribution function was measured for a weakly excited relative phase eigenstate and weakly excited 2-mode coherent states. The expt. is also (using the eigenstates) a demonstration of Heisenberg-limited interferometry.

RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 23 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:140446 HCAPLUS

DN 132:286054

TI Helium ion-implanted planar waveguide in Y-cut and Z-cut .beta.-BBO (BaB2O4)

AU Boudrioua, A.; Moretti, P.; Loulergue, J. C.; Polgar, K.

CS Centre Lorrain d'Optique et d'Electronique des Solides (CLOES),
Laboratoire Materiaux Optiques a Proprietes Specifiques (M.O.P.S),
Universite de Metz et Supelec, Metz, Fr.

SO Optical Materials (Amsterdam) (2000), 14(1), 31-39
CODEN: OMATET; ISSN: 0925-3467

PB Elsevier Science B.V.

DT Journal

LA English

AB Waveguides are formed in beta metaborate (.beta.-BBO) single **crystals** by He+ ion implantation. Both Y-cut and Z-cut samples are used. Refractive index profiles n_o and n_e are reconstructed from the effective indexes measured by dark-line mode spectroscopy and by using an iWKB method. The profiles show a step-like guiding region. **Optical** barriers with depth to $\Delta n_e = 0.04$ and $\Delta n_o = 0.1$ for Y-cut and $\Delta n_e = 0.08$ and $\Delta n_o = 0.05$ for Z-cut sample are, resp., obtained. The index changes obsd. in the electronic interaction region are small, 0.3×10^{-2} for n_o in both **crystal** cuts and -0.1×10^{-2} and -0.8×10^{-2} for n_e in Y-cut and Z-cut, resp. This is to knowledge the 1st report on **optical** waveguide characterization in this important **nonlinear** material.

RE.CNT 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 24 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 2000:21873 HCAPLUS

DN 132:71112

TI Origin of the large **nonlinear optical** coefficients in bismuth borate BiB3O6

AU Xue, D.; Betzler, K.; Hesse, H.; Lammers, D.

CS Fachbereich Physik, Univ. Osnabruck, Osnabruck, D-49069, Germany

SO Physica Status Solidi A: Applied Research (1999), 176(2), R1-R2
CODEN: PSSABA; ISSN: 0031-8965

PB Wiley-VCH Verlag Berlin GmbH

DT Journal

LA English

AB The chem. bond parameters and their contributions to the **nonlinear optical** susceptibility of monoclinic BiB3O6 were computed. The results were summarized and interpreted.

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

03/14/2003

L25 ANSWER 25 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:518341 HCAPLUS

DN 131:151463

TI CsB305 **crystal** and its **nonlinear optical** devices

IN Wu, Yicheng; Sasaki, Takatomo

PA University of Science and Technology of China, Peop. Rep. China

SO U.S., 7 pp., Cont.-in-part of U.S. Ser. No. 310,471, abandoned.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 2

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| | ----- | ---- | ----- | ----- | ----- |
| PI | US 5940417 | A | 19990817 | US 1995-573598 | 19951215 |
| | CN 1073729 | A | 19930630 | CN 1992-102773 | 19920423 |
| | CN 1027514 | B | 19950125 | | |
| | US 5381754 | A | 19950117 | US 1993-51445 | 19930423 |
| PRAI | CN 1992-102773 | | 19920423 | | |
| | US 1993-51445 | | 19930423 | | |
| | US 1994-310471 | | 19940922 | | |

AB **Nonlinear optical** devices in which an input beam results in an output beam having a different frequency (e.g., frequency doublers) are described which employ CsB305 single **crystals** with a monoclinic grown **cryst.** structure comprising a seed **crystal** of CsB305 and a **cryst.** compd. consisting of a mixt. of a cesium salt with B2O3 in an amt. to make the mole ratio of Cs2O to B2O3 be 1:3.

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 26 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:509536 HCAPLUS

DN 131:222543

TI A new layered lead hexaborate with branched radicals Pb[B6O10(OH).B2O(OH)4]: structures of the new borate, strontioborite, tunellite (nobleite), strontioginorite (ginorite, volkovite), aristarainite, and mcallisterite as representatives of the OD family

AU Belokoneva, E. L.; Korchemkina, T. A.; Dimitrova, O. V.

CS Mosk. Gos. Univ. im. M.V. Lomonosova, Moscow, Russia

SO Zhurnal Neorganicheskoi Khimii (1999), 44(6), 951-962

CODEN: ZNOKAQ; ISSN: 0044-457X

PB MAIK Nauka/Interperiodica Publishing

DT Journal

LA Russian

AB Under hydrothermal conditions, a Pb borate as a new **nonlinear optical** material was prepd., having the formula PbB8O11(OH)4 or Pb[B6O10(OH).B2O(OH)3] (I). I is monoclinic, space group P21/n, Z = 1, a 7.911(5), b 9.979(6), c 14.030(10) .ANG., .beta. 90.36(5).degree., R = 0.0458, Rw = 0.0511. I is a layered hexaborate with branched radicals. The OD (order-disorder) theory of K. Dornberger-Schiff (1964) on the OD groupoid family was used to describe the commonness and the difference of the structure of the new family of borates, including I, strontioborite SrB8O11(OH)4, tunellite SrB6O9(OH)2.3H2O and its Ca analog nobleite, strontioginorite (Sr,Ca)2B14O20(OH)6.5H2O and its Ca- and Sr-analogs ginorite and volkovite, aristarainite NaMgB12O16(OH)8.H2O and mcallisterite MgB6O8(OH)4.5.H2O.

L25 ANSWER 27 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:306230 HCAPLUS

DN 131:51593

03/14/2003

TI Spatial-temporal wave mixing for space-time conversion
AU Marom, Dan M.; Panasenkov, Dmitriy; Sun, Pang-Chen; Fainman, Yeshaiah
CS Department of Electrical and Computer Engineering, University of
California, San Diego, CA, 92093-0407, USA
SO Optics Letters (1999), 24(8), 563-565
CODEN: OPLEDP; ISSN: 0146-9592
PB Optical Society of America
DT Journal
LA English
AB A **nonlinear optical** processor that is capable of true
real-time conversion of spatial-domain images to ultrafast time-domain
optical waveforms is presented. The method is based on 4-wave
mixing between the **optical** waves of spectrally decompd.
ultrashort pulses and spatially Fourier-transformed quasi-monochromatic
images. To achieve efficient wave mixing at a femtosecond rate the
authors use a cascaded 2nd-order **nonlinearity** arrangement in a
.beta.-Ba borate **crystal** II phase matching. The authors use
this ultrafast technique to exptl. generate several complex-amplitude
temporal waveforms, with efficiency .ltoreq.10%, by virtue of the cascaded
nonlinearity arrangement.

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 28 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:184367 HCAPLUS
DN 130:303683
TI A new class of **nonlinear optical crystals**
R2CaB10O19(RCB)
AU Wu, Yicheng; Liu, Jianguo; Fu, Peizhen; Wang, Junxing; Guo, Fan; Zhao,
Guiwen; Qin, Jingui; Chen, Chuangtian
CS Department of Chemistry, University of Science and Technology of China,
Hefei, Anhui, 230026, Peop. Rep. China
SO Proceedings of SPIE-The International Society for Optical Engineering
(1998), 3556(Electro-Optic and Second Harmonic Generation Materials,
Devices, and Applications II), 8-13
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB Mixed borates of rare-earth elements and Ca R2CaB10O19 (R represents
rare-earth element) were identified in the system R2O3-CaO-B2O3. These
isostructural compds. exhibit a powder 2nd harmonic generation (SHG)
effect about twice larger than that of KDP (KH2PO4). The **crystal**
structure of La2CaB10O19 (LCB), one member of the RCB family, was detd. by
single **crystal** x-ray diffraction anal. The compd.
crystallizes in the monoclinic system, space group C2, with a
11.043(3), b 6.563(2), c 9.129(2) .ANG., .alpha. = .gamma. 90..degree.,
.beta. 91.47.degree., and two formula units per cell. LCB melts
congruently with a m.p. of 1065 .+- . 2.degree.. Single **crystals**
of LCB and Nd doped LCB in centimeter size were grown from the
stoichiometric melt. The preliminary results on properties of LCB are
presented.

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 29 OF 41 HCAPLUS COPYRIGHT 2003 ACS
AN 1999:106576 HCAPLUS
DN 130:189024
TI Exceptional large **nonlinear optical** coefficients in
the monoclinic bismuth borate BiB3O6 (BIBO)
AU Hellwig, H.; Liebertz, J.; Bohaty, L.

03/14/2003

CS Institute of Crystallography, University of Cologne, Cologne, D-50674, Germany

SO Solid State Communications (1998), Volume Date 1999, 109(4), 249-251
CODEN: SSSCOA4; ISSN: 0038-1098

PB Elsevier Science Ltd.

DT Journal

LA English

AB The monoclinic BiB3O6 (space group C2) was grown from stoichiometric melts in single **crystals** of dimensions up to 5.times.4.times.2 cm in **optical** quality. We have detd. all independent **nonlinear optical** coeffs. of 2nd harmonic generation (SHG) dijkSHG for the fundamental .lambda.0 = 1079.5 nm. The complete detn. of a dijkSHG tensor in **crystals** of monoclinic or lower symmetry was not published to our knowledge yet. Linear **optical** investigations indicate a wide range of wavelengths for phase matchable processes. The highest deff we found along the phase matched direction of SHG at 1079.5 nm is 3.2 pm/V. This value is larger than that of many other substances, such as KTiOPO4 or .beta.-BaB2O4, being widely used in applications.

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 30 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1999:88199 HCAPLUS

DN 130:229549

TI Tunable visible and NIR parametric amplifiers at 1 kHz and pulse lengths down to 10 fs

AU Lochbrunner, S.; Wilhelm, T.; Piel, J.; Huppmann, P.; Sporlein, S.; Riedle, E.

CS Institut fur Medizinische Optik, Ludwig-Maximilians-Universitat Munchen, Munchen, D-80538, Germany

SO Springer Series in Chemical Physics (1998), 63(Ultrafast Phenomena XI), 57-59

CODEN: SSCPDA; ISSN: 0172-6218

PB Springer-Verlag

DT Journal

LA English

AB Non-collinear phase matching in a type I BBO **optical** parametric amplifier seeded by a high quality continuum is shown to produce pulses at 470 to 730 nm center wavelength with lengths down to 10 fs. Type II phase matching allows to access the 700 to 1100 nm range. The amplification preserves the phase of the seed light even at high efficiency. For characterization of the ultrashort visible pulses a SiC photodiode is superior to thin **nonlinear crystals**.

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 31 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:781918 HCAPLUS

DN 130:131379

TI Thin interference films for **nonlinear crystals**

AU Levchuk, Elena A.; Novopashin, Vladimir V.; Shestakov, Alexander V.

CS Polyus Research & Development Institute, Moscow, 17342, Russia

SO Proceedings of SPIE-The International Society for Optical Engineering (1998), 3413(Materials Modification by Ion Irradiation), 245-251

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

AB The technol. of obtaining the interference coatings for the **nonlinear crystals** has some peculiarities depending on the specific properties of these **crystals**. Temp., pressure of

03/14/2003

reactive gas and energy of charged particles do not affect principally the **optical** properties of the **nonlinear crystals**. The various aspects of thin dielec. films for **crystals** (KTP, TeO₂, LBO, BBO, LiIO₃, LiTaO₃, LiNbO₃, KDP, DKDP) are presented. There are calcn. of the optimum structure of the **optical** coating for specific spectral region, obtaining the required parameters of the films having the **optical** properties that would not impair the own properties of the **crystal** as well as study of the **optical** parameters. As a rule, the coatings of these **crystals** are antireflective (AR) but in specific cases they are high reflective (HR) mirrors or cut-off filters. The effect of ion cleaning and assistance was studied to improve adhesion of the evapd. materials. This concerns specifically the **crystals** that could be coated without heating in a vacuum chamber. As the result of this work the various types of the interference coatings were obtained. There are the AR coating at a single wavelength in the spectral range of 0.24...1.5 .mu.m, the broad-band AR coatings, the AR coating with 2 AR spectral regions simultaneously.

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 32 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:579626 HCAPLUS

DN 129:279674

TI Fabrication of transparent borate glasses containing .beta.-BaB₂O₄ by incorporation method

AU Tsai, Y. E.; Chang, Y. H.

CS Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan

SO Materials Science & Engineering, A: Structural Materials: Properties, Microstructure and Processing (1998), A251(1-2), 129-134
CODEN: MSAPE3; ISSN: 0921-5093

PB Elsevier Science S.A.

DT Journal

LA English

AB The fabrication of transparent B₂O₃-based glasses contg. **non-linear optical** .beta.-BaB₂O₄ (BBO) **cryst.** particles by incorporation method was studied. The BBO particles with a diam. of about 10 .mu.m has been successfully incorporated into BaO-B₂O₃-SiO₂ glasses by adjusting the melting temp., soaking time and the amt. of BBO. The .beta.-phase could be transformed to .alpha.-phase when the remelting time and/or temp. was increased. A small difference in the refractive index n, between matrix glasses and incorporated **crystals**, is a significant reason for the transparency. The refractive index of the remelted sample was independent of particle size, and was increased by adding more contents of BBO. Moreover, the best efficiency for second harmonic generation (SHG) was 2.5% of the BBO **crystal**.

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 33 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1997:349791 HCAPLUS

DN 127:12483

TI Structure and properties of the noncentrosymmetric oxide borate K₂Ga₂O(BO₃)₂

AU Smith, Robert W.; Kennard, Mark A.; Dudik, Matthew J.

CS Department of Physics, University of Nebraska at Omaha, Omaha, NE, 68182-0266, USA

SO Materials Research Bulletin (1997), 32(6), 649-656
CODEN: MRBUAC; ISSN: 0025-5408

03/14/2003

PB Elsevier

DT Journal

LA English

AB **Crystals** of a new, noncentrosym. oxide, orthoborate were grown, and the structure of the material was detd. by x-ray diffraction techniques. The material **crystallizes** in the space group P321. The structure consists of a continuous, three-dimensional Ga borate framework with channels that run parallel to the [001] direction wherein the K atoms are located. The triangular orthoborate groups and the trigonal bases of the Ga-centered tetrahedra form two-dimensional layers through Ga-O-B linkages; these layers are parallel to (001) planes. Ga-O-Ga linkages interconnect adjacent layers to complete the three-dimensional framework. Use as a **nonlinear optical** material is unlikely because of nonoptimal alignment of the triangular orthoborate groups.

L25 ANSWER 34 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1997:281289 HCAPLUS

DN 126:284999

TI **Nonlinear optical** material showing high SHG activity and its manufacture

IN Yamada, Kazuhiro

PA Mitsui Petrochemical Ind, Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| | ----- | ---- | ----- | ----- | ----- |
| PI | JP 09061864 | A2 | 19970307 | JP 1995-215963 | 19950824 |
| PRAI | JP 1995-215963 | | 19950824 | | |

AB The material, represented by BaAl₂B₂O₇ without a center symmetry, is manufd. by **crystal** growth using BaCO₃, Al₂O₃, and H₃BO₃ (anhydride) as sources. The growth may be performed by melt solidification from a (compacted) mixed powder of above sources or by firing the powder at 900-940.degree.. The sources may be Ba aluminate and H₃BO₃ (anhydride).

L25 ANSWER 35 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1997:243731 HCAPLUS

DN 126:231331

TI Cesium borate-based **nonlinear optical** material and its manufacture by **crystal** growth

IN Yamada, Kazuhiro

PA Mitsui Petrochemical Ind, Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| | ----- | ---- | ----- | ----- | ----- |
| PI | JP 09033964 | A2 | 19970207 | JP 1995-179201 | 19950714 |
| PRAI | JP 1995-179201 | | 19950714 | | |

AB The material comprises KCsB₆O₁₀ or RbCsB₆O₁₀. The material is manufd. by **crystal** growth from (A) a carbonate or borate of K or Rb, (B) a carbonate or borate of Cs, and (C) **boric acid** or anhyd. **boric acid**. The material showed high 2nd harmonic generation.

03/14/2003

L25 ANSWER 36 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1996:205046 HCAPLUS

DN 124:274074

TI Semi-organic **crystals** for nonlinear optical devices

IN Cunningham, Patricia H.; Warren, Leslie F., Jr.; Marcy, Henry O.; Rosker, Mark J.

PA Rockwell International Corp., USA

SO Eur. Pat. Appl., 10 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | EP 693704 | A1 | 19960124 | EP 1995-109113 | 19950613 |
| | EP 693704 | B1 | 20020828 | | |
| | R: DE, FR, GB | | | | |
| | US 5581010 | A | 19961203 | US 1994-278741 | 19940722 |
| | JP 08054654 | A2 | 19960227 | JP 1995-184266 | 19950720 |
| PRAI | US 1994-278741 | A | 19940722 | | |

AB **Nonlinear optical** materials include a noncentrosym.

crystal of an anionic boron complex salt contg. a cation and at least one org. ligand coordinated to a boron atom. The **nonlinear optical crystal** may consist of a compd. having the formula $A[BC_2]$ where A is a monocation, B is boron, and C is the org. ligand, or a compd. having the formula $A[BC_2]_2$ where A is a dication, B is boron, and C is the org. ligand. The org. ligands may also be org. mols. having .alpha.-dihydroxy functionalities. The org. ligands may be selected from the group consisting of .alpha.-hydroxy carboxylic acids and 1,2-diols or from the group consisting of D-malic acid, D-lactic acid, D-tartaric acid, dimethyl-D-tartrate, diethyl-D-tartrate, L-malic acid, L-lactic acid, L-tartaric acid, dimethyl-L-tartrate, diethyl-L-tartrate, and ethylene glycol. The anionic boron complex may be selected from the group consisting of boro-di(L-malate), boro-di(L-tartrate), boro-di(L-lactate), boro-di-(diethyl-L-tartrate), boro-di(dimethyl-L-tartrate), boro-di-(D-malate), boro-di(D-tartrate), boro-di(D-lactate), boro-di-(diethyl-D-tartrate), boro-di(dimethyl-D-tartrate) and boro-di(ethylene glycolate). The cation may be selected from the group consisting of alkali metals, alk. earth metals, ammonium ions, and Group IIB dications. The cation may be further selected from the group consisting of lithium, sodium, potassium, and ammonium NH_4^+ ion, the guanidinium $C(NH_2)_3^+$ ion, calcium, and zinc. **Nonlinear optical** devices (e.g., electrooptical modulators) employing the materials are also described.

L25 ANSWER 37 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1996:164150 HCAPLUS

DN 124:215638

TI Method for wavelength conversion using BBO **crystal** and apparatus therefrom

IN Yamato, Soichi; Taira, Yoichi

PA Ibm, Japan

SO Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|----|-------------|------|----------|-----------------|----------|
| PI | JP 08006082 | A2 | 19960112 | JP 1994-137046 | 19940620 |

03/14/2003

PRAI JP 1994-137046 19940620

AB A wavelength converter comprising an **optical nonlinear crystal**, such as BBO, disposed in an **optical resonator** for the enhancement of the conversion efficiency, wherein the fundamental wave resonance frequency of the resonator is controlled by the elec. field applied to the **optical nonlinear crystal**.

L25 ANSWER 38 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1996:5864 HCAPLUS

DN 124:40972

TI **Nonlinear optical crystal** device

IN Sotozaki, Minehiro; Wada, Hiroyuki

PA Sony Corp, Japan

SO Jpn. Kokai Tokkyo Koho, 16 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|--------------|------|----------|-----------------|----------|
| PI | JP 07244310 | A2 | 19950919 | JP 1995-3280 | 19950112 |
| | US 5581395 | A | 19961203 | US 1995-369767 | 19950106 |
| PRAI | JP 1994-1467 | | 19940112 | | |

AB The title device capable of generating higher order harmonics, comprising a **nonlinear optical crystal**, such as, KDP and BBO, having a multilayer protective film on the light incident and output surfaces, wherein the layer in direct contact with the **crystal** surface is prepd. by an ion plating method.

L25 ANSWER 39 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1995:623604 HCAPLUS

DN 123:22803

TI **Crystal**-pulling method for growing boron cesium oxide single **crystal** and **non-linear optical**

material-containing apparatus using same

IN Wu, Yicheng; Zouzuomu, Xiaoyou

PA China University of Science and Technology, Peop. Rep. China

SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 9 pp.

CODEN: CNXXEV

DT Patent

LA Chinese

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | CN 1085612 | A | 19940420 | CN 1992-112293 | 19921010 |
| PRAI | CN 1992-112293 | | 19921010 | | |

AB The single **crystal** having a desirable size is manufd. by mixing Cs₂O and B₂O₃ (e.g., using Cs₂CO₃ or CsNO₃ and H₃BO₃ or B₂O₃) having the mol ratio 1:3 in a platinum crucible, heating the mixed material to melt, lowering a seed **crystal** at a temp. slightly higher than the m.p. of B₃CsO₅, rotating the seed **crystal** at a rate <45 rpm, and pulling the seed **crystal** at a speed 0-5 mm/h. The **optical** app. uses as a **nonlinear optical** material the B₃CsO₅ single **crystal** which produces at least a beam of electromagnetic radiation having a frequency different from that of an incident radiation. The B₃CsO₅ single **crystal** shows a high conversion efficiency, superior in resistance to **optical** damage, and is capable of producing an UV having a wavelength as short as 170 nm.

L25 ANSWER 40 OF 41 HCAPLUS COPYRIGHT 2003 ACS

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AN 1995:613081 HCAPLUS
DN 123:22806
TI **Crystal** growth of lead-containing .beta.-barium borate
IN Inui, Takeshi; Yahashi, Hideo
PA Ibiden Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|----------------|------|----------|-----------------|----------|
| PI | JP 07089796 | A2 | 19950404 | JP 1993-238040 | 19930924 |
| PRAI | JP 1993-238040 | | 19930924 | | |

AB The **crystal** .beta.-(Ba,Pb)B2O4 is grown by pptg.
(Ba,Pb)B2O4.cntdot.4H2O from H3BO3, BaCl2.cntdot.2 H2O, and PbCl2,
sintering into (Ba,Pb)B2O4 materials, and **crystal** growth by
drawing method. The **crystal** is useful as **nonlinear**
optical materials.

L25 ANSWER 41 OF 41 HCAPLUS COPYRIGHT 2003 ACS

AN 1993:112394 HCAPLUS
DN 118:112394
TI Sol-gel derived .beta.-BBO thin film
AU Nie, Wenjiang; Lurin, Christian; Paz-Pujalt, Gustavo R.
CS Res. Technol. Cent., Kodak-Pathe, Chalon sur Saone, 71102, Fr.
SO Proceedings of SPIE-The International Society for Optical Engineering
(1992), 1758(Sol-Gel Opt. II), 284-91
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
AB .beta.-BaB2O4(.beta.-BBO) is known as one of the best inorg.
nonlinear crystals. It is now widely used for frequency
doubling, frequency mixing in the UV range and **optical**
parametric oscillation in the UV and near-IR regions. To put this
material into thin film form would make it very attractive for integrated
optical devices. Vacuum deposition techniques are not suitable
for the fabrication of borates thin films due to the difficult evapn. or
sputtering of oxides based on light elements. The low processing temp. of
the sol-gel method allows the formation of stoichiometric and expected
oxygen coordination of BaB2O4 in liq. phase. .beta.-BBO thin film has
been successfully prepd. by the sol-gel method through hydrolysis of
barium and boron alkoxides. The accomplishment of hydrolysis is found to
be essential for the removal of residual org. at high temps. The choice
of precursors, hydrolysis ratio, and thermal treatments have crit.
influences on the formation, the morphol. and the nucleation of .beta.-BBO
phase of the film. The undesirable interaction between the film and the
substrate limits the formation of .beta.-BBO polycryst. film to only few
selected substrates.

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L28 ANSWER 3 OF 10 HCAPLUS COPYRIGHT 2003 ACS

AN 1998:694043 HCAPLUS

DN 129:348837

TI A new nonlinear optical borate crystal K₂Al₂B₂O₇ (KAB)

AU Hu, Zhang-Gui; Higashiyama, Tetsuji; Yoshimura, Masashi; Yap, Yoke Khin; Mori, Yusuke; Sasaki, Takatomo

CS Department of Electrical Engineering, Osaka University, Osaka, 565-0871, Japan

SO Japanese Journal of Applied Physics, Part 2: Letters (1998), 37(10A), L1093-L1094

CODEN: JAPLD8; ISSN: 0021-4922

PB Japanese Journal of Applied Physics

DT Journal

LA English

AB A new nonlinear optical (NLO) borate crystal K₂Al₂B₂O₇ (K

Al Borate, KAB) was discovered. The structure was established by 4-axis x-ray diffraction methods. The material crystallizes in the trigonal space group P321 with a 8.5657(9) .ANG., C = 8.463(2) .ANG. and Z = 3. KAB possesses a space arrangement similar to Sr₂Be₂B₂O₇ (SBBO). A KAB crystal with a dimensions of 30 x 15 x 1 mm³ was grown using the Top-Seeded Soln. Growth (TSSG) method. The optical properties of KAB were measured.

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

03/14/2003

L28 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2003 ACS

AN 1980:536626 HCAPLUS

DN 93:136626

TI Unusual properties of iron ion clusters in high-boron glasses

AU Kornilova, E. E.; Petrovskii, G. T.; Stepanov, S. A.

CS USSR

SO Doklady Akademii Nauk SSSR (1980), 251(2), 409-13 [Chem. Tech.]

CODEN: DANKAS; ISSN: 0002-3264

DT Journal

LA Russian

AB The formation of Fe³⁺ ion clusters in **K Al**

borate glasses contg. ≥ 75 mol% B₂O₃ was detected by the extreme increase in the absorption band intensity of Fe³⁺. Tests were made with glasses K₂O.xAl₂O₃.(100 - 2x)B₂O₃.1.5Fe₂O₃, where x = 12.5, 10.0, and 7.5 mol%. The glasses were melted in quartz crucibles at 1300.degree. from a charge of KNO₃, Al₂O₃, and H₃BO₃ and subsequently heat-treated at 440-750.degree. for 3 h. Large clusters of unusual Fe³⁺ complexes -Fe-O-Fe- with an av. of 4.6 Fe³⁺ in each cluster were obsd. in the heat-treated glasses. The high stability of the magnetic and optical properties of the glasses was attributed to the const. size and structure of Fe³⁺ clusters in a wide temp. range.